

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Patent Application of:  
Per Andersson et al.

Application No.: 09/674,457

Confirmation No.: 8539

Filed: May 7, 1999

Art Unit: 1743

For: MICROFLUIDIC DEVICE

Examiner: D. K. Handy

**APPELLANT'S RESPONSE TO EXAMINER'S ANSWER (37 CFR 1.193(b))**

MS Appeal Brief - Patents  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

**ATTENTION: BOARD OF PATENT APPEALS AND INTERFERENCES**

This Reply is in response to the Examiner's Answer mailed December 28, 2006. Appellants believe no fees are due with this response. However, if Appellants are in error, the Commissioner is hereby authorized to charge any deficiency in the fees filed, asserted to be filed or which should have been filed herewith (or with any paper hereafter filed in this application by this firm) to our Deposit Account No. 06-2375, under Order No. 10104200.

**I. 35 U.S.C. 102****A. ISSUE: Are claims 43-47 anticipated by Kellogg et al. (6,143,248) under 35 U.S.C. 102(e).**

The issue remains the same.

**I. Does Kellogg et al. teach a hydrophobic section within a hydrophilic pathway.**

During the prosecution of this application, the Examiner acknowledged that Kellogg does not teach a hydrophobic section within a hydrophilic pathway. See Office Action dated 02/03/2004. Additionally, the Examiner in a related continuation application (USSN 11/302,713) acknowledged that “Kellogg does not teach a hydrophobic section within a hydrophilic pathway to form a valve.” See Office Action for USSN 11/302,713 dated 06/30/2006, page 4, 4<sup>th</sup> paragraph, submitted with the Appeal Brief.

Thus, consistent with the Examiner’s previous position and most recent assessment of Kellogg, Appellants assert that Kellogg does not teach a hydrophobic section with a hydrophilic pathway to form a valve, and thus, Kellogg lacks one of the elements in the claims and therefore can not anticipate the claims on Appeal.

However, in spite of the Examiner’s recent opinion that Kellogg et al. does not teach the claim limitation of a hydrophobic section in a hydrophilic pathway, the Examiner, using hindsight, continues to pick and choose random, unrelated teachings of Kellogg et al. and has maintained his rejection based upon a “new passage” in Kellogg et al. See page 7 of the Examiner’s Answer dated 12/28/06.

The Examiner respectfully disagrees. No picking and choosing from the teaching of Kellogg is required. The passage from Kellogg cited by the Examiner (column 10, line 58 through column 11, line 54 – reproduced above) clearly recites the structural features required by claim 43 (column 11, lines 5-40). In addition, Kellogg recites the steps of flowing the fluid until it reaches a non-wettable (i.e. hydrophobic) portion of the pathway, and then applying additional force to allow the fluid to pass the non-wettable section (column 11, lines 39-54).

The Examiner appears to rely upon Col. 11, lines 39-54 of Kellogg to teach a hydrophobic portion of a pathway. Appellants contend that the Examiner has misconstrued this passage (col. 11, lines 39-54) of Kellogg, which states the following:

(110) **The second end of the second microchannel comprises a surface that is non-wetting or alternatively the second end of the second microchannel defines an opening into the second fluid reservoir. Rotation of the platform at the first rotation speed does not motivate flow of the displacement fluid through the second microchannel. Rotation of the platform at a second rotational speed that is greater than the first rotational speed motivates flow of the fluid from the first fluid chamber, through the second microchannel and into the second fluid chamber. As a consequence of the properties of the second end of the second microchannel, flow of the fluid into the second fluid chamber comprises a stream of droplets from about 0.1 to about 10 .mu.L in volume. In addition, each of the microchannels and the fluid chambers also comprise air displacement channels whereby air displaced by fluid movement is vented to the surface of the platform.**

In view of this passage, Kellogg does mention a non-wetting surface at the *end* of a microchannel. However, nowhere in this “new passage” that Appellants can identify does Kellogg mention that the fluid pathway is hydrophilic. Kellogg teaches a non-wetting surface at the end of the microchannel that is for the production of droplets shown below in the attached FIG 3B of Kellogg.

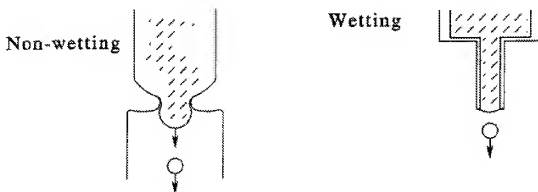


FIG. 3B of Kellogg

Based upon examination in context of the description (Col. 20 and 21) and FIG. 3B, the passage referred to by the Examiner suggests that both the reservoir and the microchannel connecting to it comprise the same surface modification-- both are hydrophobic (i.e., non-wetting Fig. 3B) or hydrophilic (i.e., wetting Fig. 3B). This does not teach a method of controlling flow of a liquid by using a hydrophobic section within a hydrophilic pathway in a microfluidic device. Kellogg only teaches or suggests the use of tube geometry in a system in which the entire system (channels and reservoirs) are either hydrophilic or hydrophobic. Kellogg does not teach a mixed system (hydrophobic section within a hydrophilic pathway) as claimed in the present invention. (See col. 29, lns. 1-20; See also Figures 2 and 3 and the corresponding text, cols. 18-21.

In summary, Appellants, as well as the Examiner (*See Office Action for USSN 11/302,713 dated 06/30/2006, page 4, 4<sup>th</sup> paragraph*), contend that Kellogg does not teach the element of a hydrophobic section within a hydrophilic pathway. Thus, Kellogg et al. can anticipate the claims on appeal.

**2. *Is the device of Kellogg et al. capable of handling less than 500 nl?***

The Examiner maintains that he “fails to see how Kellogg is not capable of handling the 500 nanoliter amount claimed by the Appellants.” See Examiner’s Rejection dated 03/09/06, section 9, last paragraph.

“The express, implicit, and inherent disclosures of a prior art reference may be relied upon in the rejection of claims under 35 U.S.C. 102 or 103.” MPEP 2112 (Requirements of Rejection Based on Inherency; Burden of Proof). Under the principles of inherency, if a prior art device, in its normal and usual operation, would necessarily perform the method claimed, then the method claimed will be considered to be anticipated by the prior art device. *In re King*, 801 F.2d 1324, 231 USPQ 136 (Fed. Cir. 1986). “In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art.” *Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990) (emphasis in original).

This is not “a basis in fact and/or technical reasoning” supporting the argument that the inlet or entry port of the device disclosed in Kellogg et al. necessarily is capable of handling sample volumes of 500 nanoliter or less. In the Examiner’s Answer dated 12/28/06, the Examiner still maintains this flawed reasoning and states that the reason is “that the inlet port having a volumetric capacity of 1,000-150,000 is inherently capable of handling less than this volume.” Appellants assert that this is not “a basis in fact and/or technical reasoning” and the conclusion does not necessarily flow from the reasoning.

This reasoning by the Examiner is analogous to saying that a water system having a reservoir and pipes for water flow in which the reservoir is capable of handling 1000-150,000 billion gallons of water could handle less than 500 gallons of water. Yes, the 500 gallons of water would fit inside the reservoir, however, one of skill in the art would recognize that this small volume would not necessarily flow effectively or be pumped effectively, into the pipes compared to the appropriate volumes in which the reservoir and pipes were designed. Thus, this reasoning by the Examiner is flawed and the Examiner has not met his burden. Hence, there is

no valid rejection for the Appellants to overcome and the anticipation rejection relying on Kellogg et al. should be overruled.

**B. Issue: Are claims 43 – 47 anticipated by Kellogg et al. (WO 98/07019) under 35 U.S.C. 102(a).**

The outstanding issues are similar to the issues relating to the above 102(e) rejection. The disclosures of WO 98/07019 and US 6,143,248 are substantially similar, as indicated by the Examiner, as they both claim priority to US Provisional Application 60/023,756 filed August 12, 1996. *See* Office Action dated 03/09/06, page 4. In the interest of brevity for the Board, the above discussion for 102(e) is equally applicable to this 102(a) rejection and is incorporated herein.

**II. 35 U.S.C. 103(a)**

***Issue: Does Kellogg et al. provide a suggestion to use a sample volume of 1 to 10 nl?***

Appellants remind the Examiner that to establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). Appellants assert that Kellogg does not teach or suggest a sample volume of 1 to 10 nl.

The Examiner maintains the argument that the motivation to modify Kellogg et al. is based on the fact that one would want to conserve sample material. Appellants assert that the statement “wanting to conserve sample” is a conclusory and unsubstantiated statement on motivation to modify that cannot support a *prima facie* case of obviousness and is an inappropriate application of the “obvious to try” standard. The mere fact that the sample volume may fit into the device of Kellogg does not equate to a volume that could be analyzed in the device of Kellogg. Appellants assert that the “obvious to try” standard has been held to constitute an improper ground for a 35 USC § 103 rejection. *See In re O’Farrell*, 858, F.2d 894, 903 (Fed. Cir. 1988). Thus, this reasoning by the Examiner is flawed, and the rejection should be reversed.

Furthermore, if an independent claim is non-obvious under 35 U.S.C. 103(a), then any claim depending therefrom is by definition non-obvious. *In re Fine*, 5 USPQ 2d 2596 (Fed. Cir. 1988).

Thus, Appellants request that the rejection be withdrawn.

### **CONCLUSION**

As for any of the claims not specifically discussed above, Appellant hereby reasserts the arguments presented in Appellant's Appeal Brief.

For the reasons advanced in Appellant's Appeal Brief and in this Reply, Appellant respectfully submits that claims 43-47 are of patentable merit. Therefore, reversal of the outstanding rejections is courteously solicited.

Appellants believe no fee is due with this response. However, if a fee is due, please charge Deposit Account No. 06-2375, under Order No. 60889/HO-P02191US0/10104200 from which the undersigned is authorized to draw.

Dated: February 28, 2007

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